Spontaneous Extension of High Molecular Substances

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by the similar after drawing and formalization as in the usual after-treatment of vinylon. The formalization is necessary for fibers to give a high resistance to boiling water. The emulsion polymers are contained in a PVA fiber only in the state of emulsion particle after spinning, but they would be elongated and conglutinated mutually and would form a continuous structure through the drawing process of the fiber at an elevated temperature or in the swelling agent of lemulsion polymers.

The micro structure of the fibers and the deformation of the emulsion particles during these processes were observed by a photo- and electron-microscope and examined by X-ray scattering pattern.

Some properties of these new fibers were examined and it was proved that they have a superior tensile strength almost as that of usual vinylon, and have a better elastic recovery than the latter.

It is interesting that various kinds of the mixed component fibers might be prepared by the mixed emulsion spinning even from the other combination of polymers which have no affinity each other.

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Kobunshi Kagaku (Chemistry of High Polymers), 18, 205 (1961)

The spontaneous extension of cellulose derivatives has hitherto been studied by some investigators, but a work concerning the similar phenomena in many other high polymer substances has scarecely so far appeared. This paper is concerned with the spontaneous extension of cellulose acetate and many other substances. The change in length of various substances by heating or immersion in swelling agents are measured. It was found that the spontaneous extension takes place under a proper condition in the case of polyethylene, polytrifluoromonochloroethylene, polyvinylidenchloride, nylon, *etc.*, whereas it scarecely occurs in polyethylene terephthalate, polyvinyl chloride and poyvinyl alcohol. Some considerations on these phenomena were given.